7. Natural Ecology

The chapter on the Natural Ecology focuses on the concept of sustainability and the need to frame decisions about development and growth in the context of their impact on future generations. The focus of the section is accordingly on the protection of the environment that supports our communities, and also on the management of human activity. Noise pollution, water quality in the river, lakes, streams and wetlands, and the impact of public sector as well as private activities in new construction, building design and retrofit, landscaping, fleet management and energy conservation, are all important features of this chapter.

7.1 Minneapolis will manage the use of the city's environmental resources (including air, water and land) in order to meet present needs while considering future concerns.

7.2 Minneapolis will support the current airport location but advocate measures to reduce its noise impact.

7.3 Minneapolis will control non-airport sources of noise pollution through the permit review process.

7.4 Minneapolis will encourage the planting and preservation of trees and other vegetation.

7.5 Minneapolis will protect and sustain its water resources.

7.6 Minneapolis will take measures to reduce water consumption and encourage water conservation.

7.7 Minneapolis will provide clean and ready to develop sites for business activity occurring within the city's boundaries.

7.8 Minneapolis will continue to support pollution prevention programs as an important first step in maintaining a healthy physical environment.

7.9 Minneapolis will make buildings more energy efficient.

7.10 Minneapolis will enhance the safety and appearance of our built environment through education, inspection and enforcement.

7.11 Minneapolis will operate waste management programs that focus on reducing solid waste, reusing and recycling materials.

7.12 Minneapolis will play a leadership role in setting up examples and pilot projects.

introduction

The Minneapolis Plan, has talked about neighborhood livability in many different aspects. The quality of air, water, and land that city dwellers encounter in the course of their everyday activities plays a very important role in understanding the impact people have on their environment. This chapter of the Plan focuses attention on both the natural elements that influence how we build and manage the city we live in and on the impact human activity has on those same natural elements. Natural geologic or vegetative features, the urban forest, lakes and shoreland, rivers, and creeks and ground waters, air, and some degree of quiet define the natural resources we enjoy in Minneapolis.

a sustainable city

Creating a sustainable city, a place where present day decisions about resource use and land development do not impinge on the quality of air, water, land and the economic livelihood of future generations, requires action on a number of fronts. In a growth-oriented strategy for the city's future, like the one proposed in The Minneapolis Plan, it is clear that some things must grow, such as jobs, productivity, wages, capital and savings, profits, information, knowledge, and education. As a community, we must diminish negative consequences that are associated with unmanageable urban expansion, such as pollution, waste, habitat destruction, flooding and poverty. Gaining a better understanding of how to influence human impacts on the environment that are transacted every day as we travel, work, maintain our homes and feed ourselves, involves changing our perceptions of long-term costs and benefits.

Other chapters in The Minneapolis Plan have addressed economic and social aspects of sustainable policy and planning for the future. The Natural Ecology chapter discusses the environmental aspects of sustainable development policy found in The Minneapolis Plan. Policies found in this chapter are grouped around broader themes addressing the quality and stewardship of the environment, and the management of human impact.

Minneapolis has enormous untapped resources that enable the community as a whole to respond creatively and effectively to the challenges it faces. The entire community has inherited a valuable legacy of natural riches in the land, air and water that are found in the city. Establishing a principle of sustainability to guide future decision making encourages us to think of the legacy that we will leave for future generations. In this spirit, economic growth must be redefined to include the understanding that economic change and technological innovation serve as the genuine underpinnings of greater prosperity, equity and environmental quality. Taking action now to preserve the choice and quality of life for future generations is a deeply rooted responsibility to the city's future that all members of the community share.

7.1 Minneapolis will manage the use of the city's environmental resources (including air, water and land) in order to meet present needs while considering future concerns.

Environmental progress will depend on individual, institutional, and corporate responsibility, commitment, and stewardship.

Economic growth, environmental protection, and social equity are linked. It is important to develop integrated policies to achieve these goals.

Implementation Steps

Improve air quality and reduce noise by mitigating impacts and reducing sources for emissions or noise pollution.

Continue to invest in maintaining excellent water quality for consumption and recreational purposes.

Invest in environmental clean up and land assembly to ensure the continued availability of urban land for business activity or housing redevelopment.

protection of natural features

noise

Some forms of pollution that threaten residents' sense of livability reside in the air. Air and noise pollution have a direct impact on health. Residents of South Minneapolis have experienced tremendous change in their neighborhood livability over the last 15 years, as the Minneapolis-Saint Paul International Airport has increased its operations dramatically and noise pollution has become a constant presence in these neighborhoods. A disproportionate number of city residents live directly in the path of airport traffic; estimates tell us that the number of Minneapolis homes affected by noise is more than six times the combined number of all other affected homes in other communities. Airport noise is the most significant factor negatively influencing quality of life for many neighborhoods in South Minneapolis. This occurs primarily because a higher percentage of flights use the parallel runways over Minneapolis in their takeoffs and landings.

Yet the airport is a tremendous resource for the entire state. It produces jobs and economic prosperity for thousands of residents and provides the infrastructure and transportation capacity many thriving Minnesota businesses need to remain competitive. The business community's reliance on adequate air transportation in order to compete in the global marketplace is a very important factor influencing the city's relationship to the airport. The travel access it provides passengers is also a tremendous benefit to residents of the city and the entire region.

> *"Changes in airport operations have meant that Minneapolis and Eagan have endured the noise equivalent of an additional medium-sized airport".*

The city has developed several principles on which to base decisions and planning for the airport's future. These principles begin with the first and most important point of agreement, that the city will contract with the Metropolitan Airports Commission to preclude the construction of a third parallel runway. The air traffic and noise impact of a third parallel runway would be unacceptable for Minneapolis residents.

7.2 Minneapolis will support the current airport location but advocate measures to reduce its noise impact.

Implementation Steps

Extend the noise insulation program to the FAA's 60 DNL line.

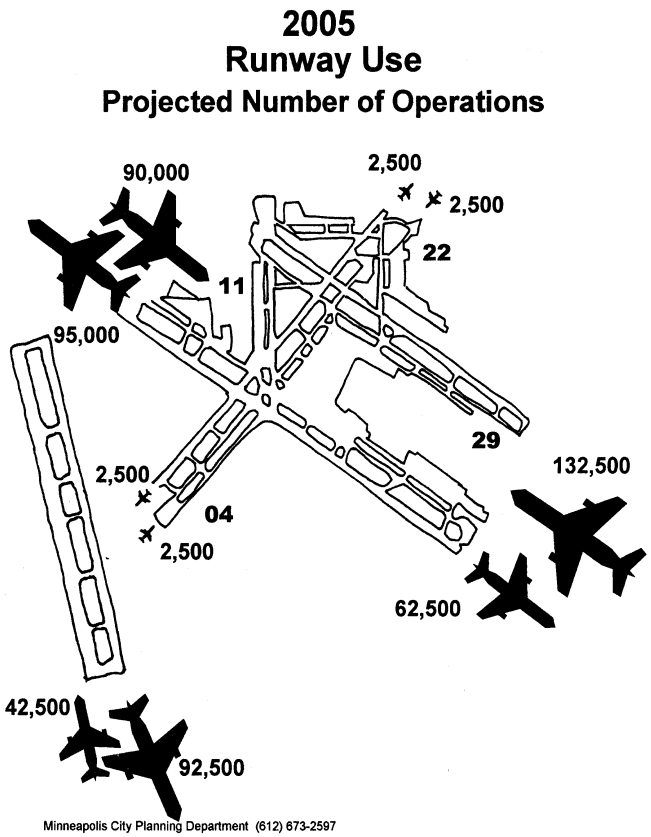
Include multifamily dwellings, nursing homes, and day care centers in the noise insulation program.

Aggressively pursue the conversion of the entire MSP fleet to Stage 3 (reduced noise impact) aircraft by the year 2000.

Make more use of runway 4-22 and maximize use of a new north-south runway, 17-35.

Contract with the Metropolitan Airports Commission to preclude the building of a third parallel runway.

Increase the number of noise systems monitors to provide more coverage of actual noise impacts.



Other noise polluting sources will also be controlled by city regulatory encouragement or permit review requirements. Requiring a noise abatement component of large scale projects, as well as enforcement, are the key realms in which the city can act successfully. Another recourse is to work with the state in developing noise mitigation components along freeways and highways. By developing a range of responses that can be implemented at the municipal level, Minneapolis will demonstrate its leadership, whether in approving financing for applicant projects or requiring compliance in a permit review process, or requiring mitigation measures due to roadway noise.

7.3 Minneapolis will control non-airport sources of noise pollution through the permit review process.

Implementation Steps

Seek stricter enforcement of noise standards for vehicles (especially motorcycles, trucks and buses), small engines (leaf blowers, lawnmowers, snow blowers and chain saws), and stereo systems.

Seek provisions and legislation which incorporate noise standards into the state's vehicle inspection program.

Require projects that receive city assistance to comply with the regularities governing noise pollution.

Work with participating organizations, owners and developers, to buffer and reduce to acceptable levels noise originating from industry, railroads, freeways or highways which are in or adjacent to residential areas.

tree cover and the urban forest

An important aspect of overall improvements to the quality of our air, water, neighborhoods and public spaces is the presence of mature, healthy trees in the city. The urban forest provides many

pleasures, and serves many purposes, and includes gardens and wetlands as well as trees planted on street boulevards and in parks and other public places. Strategic tree planting is a proven complementary approach to conserving energy because trees and other foliage provide shade and form windbreaks. The planting and maintenance of shade trees should be considered by all city departments as an investment in public infrastructure.

There are other purposes and pleasures provided by the urban forest, gardens and wetlands. Plants, particularly trees, wetland species and native prairie grasses play a significant role in flood control by intercepting, filtering and storing water, and slowing the rate and volume of runoff. They clean the air as they transform and render harmless many pollutants and convert carbon dioxide into oxygen. Mature trees provide a leafy canopy over city streets for three seasons of the year, calming traffic, buffering noise and beautifying the city in simple and effective ways.

7.4 Minneapolis will encourage the planting and preservation of trees and other vegetation.

Implementation Steps

Adopt a tree preservation and replacement ordinance for public and private developments.

Encourage the planting and replacement of trees on public and private property.

Encourage the use of plant communities native to the Twin Cities which achieve native biodiversity and wildlife habitat (particularly for resident and migratory songbirds and waterfowl).

Develop protection measures for unique ecosystems including remaining areas of native vegetation (particularly oaks and wetland vegetation).

Continue to invest in the health of the urban forest by avoiding tree monocultures and planting a variety of native and other hardy non-invasive species.

water

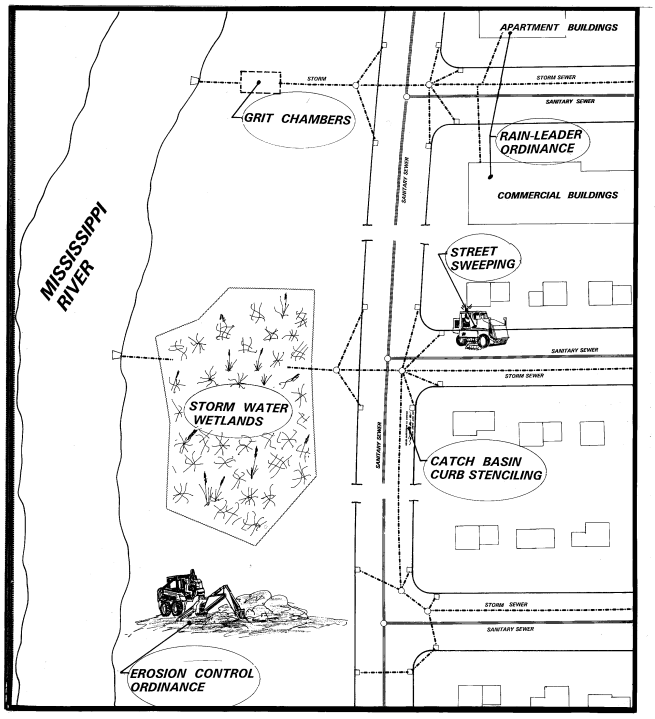
Minneapolis has a tradition of valuing its lakes, rivers, streams and wetlands. The city's water features are cherished places and the quality of water is affected by everything left in or near the street. Stormwater carries these materials, from oil, pesticides, coolants, fertilizers and detergents into lakes, creeks, wetlands and eventually the Mississippi River. The plant and animal life sustained by these bodies of water are endangered when pollutants and excess organic matter upset the delicate balance of the ecosystem. The quality of drinking water is threatened and recreational water quality is also significantly impacted.

Every community within the metropolitan area falls entirely within the drainage basin of the Mississippi River, which is Minneapolis' primary source of water. Sharing responsibility for the Mississippi with a number of other communities requires a variety of cooperative and collaborative efforts. Decisions that affect the condition of the river are made at every level, from municipal level government decisions about water supplies, to an individual's choices about gardening and yard care.

As knowledge of the extent and degree to which urban activities impact water resources has increased, so has our understanding of the measures that must be taken to respond to those consequences. For example, the city is called upon to reduce the severity and frequency of flooding and high water, to improve the chemical and physical quality of surface water in the city's bodies of water, and to minimize public expenditures to avoid or correct such problems in the future. The goals of city efforts to protect residents from flood damage are not only to eliminate the threat of flooding, but to maintain high standards of visual quality, to bolster property values, and often to strengthen a sense of community by providing attractive, multi-use areas.

Storm water wetlands protect the city's water quality

source: Minneapolis Public Works



Comprehensive watershed management plans are a well established tool used in monitoring and protecting water quality and water management, and have been or are being developed for the four watersheds in which Minneapolis resides. In conjunction with the development of Minneapolis' Local Water plans and stormwater and erosion control ordinances, there will be a thorough set of plans and controls to protect the city's different watershed areas from undue stress in the form of pollutants, contaminated or excessive stormwater runoff, and soil erosion. (See Map 1.7.1)

7.5 Minneapolis will protect and sustain its water resources.

Implementation Steps

Provide an adequate supply of safe drinking water to Minneapolis and suburban customers.

Upgrade facilities as necessary and provide scheduled and unscheduled maintenance and construction of the water distribution system to ensure water supply delivery of the highest possible quality to Minneapolis and suburban customers.

Develop and adopt a municipal Water Plan in conformance with local watershed groups and regional, state and federal agencies, in order to properly manage water resources and to help all citizens be stewards of irreplaceable natural resources such as clean water.

Undertake community-based and citywide measures to protect lake water quality by managing storm runoff, employing erosion control measures and other best management practices.

Encourage practices that result in either reduced overall amounts of impervious surfaces, or disconnect impervious surfaces and allow water to be slowed or detained in vegetated areas where it will do no harm to homes or property.

Preserve and restore wetlands for their irreplaceable contributions to water quality, control of floodwater rates and volumes, wildlife habitat and aesthetic purposes.

Develop and adopt a stormwater management ordinance for projects that will result in sizable land disturbance activity, with design standards for appropriate "best management practices" in order to reduce both runoff volume and contaminant loading from surface water runoff.

Coordinate and collaborate with other communities and regional, state and federal agencies to preserve the quality of water in the Mississippi River and other water bodies regarding National Pollutant Discharge Elimination System requirements.

Adopt regulations encouraging the stabilization and re-vegetation of slopes and riverbanks.

Work with other communities and agencies to preserve the quality of water in the Mississippi River, streams and other lakes.

Clean, inspect, repair and renovate sanitary sewers and structures.

water conservation and energy savings

Providing water to our homes and businesses consumes a great deal of energy. Before water reaches our homes, businesses or manufacturing sites, it must be pumped, transported and heated. Conserving water resources, and realizing energy savings, benefits consumers as well as utility companies, and sets an important precedent for environmental responsibility to be shared among all members of the community. Conservation initiatives ranging from free or low-cost installation of water-saving devices, stricter controls over leaks in distribution networks, and billing systems based on volumetric consumption are all measures that will further conservation goals.

7.6 Minneapolis will take measures to reduce water consumption and encourage water conservation.

Implementation Steps

Retrofit municipal buildings with water conserving fixtures.

Explore the possibility of developing a conservation program that would include a surcharge on basic water rates of both Minneapolis and suburban customers.

land reclamation

Since cities became the main focus for mechanized and industrial production, the by-products of industrial activity have posed an environmental threat to the continued productive use of these lands. Industrial activities producing heavy impacts on neighboring areas, in terms of polluted land, airborne toxics, and groundwater pollution, have historically located within the city limits, close to transportation networks, markets and suppliers. This pattern of urban industrial development, found all over the country beginning in the mid 19th century, has left Minneapolis with a considerable number of contaminated sites, and consequently with a more urgent need to clean up these areas in order to continue to use land safely and productively. Rehabilitation of some contaminated sites from brownfields to green, open spaces is an important consideration for the city's pollution remediation strategy. However, one of the key platforms of the city's Economic Development Strategy is to ensure that there is adequate land available for development by becoming involved in site assembly, assisting with land readiness and contributing to land cleanup projects that merit public investment.

7.7 Minneapolis will provide clean and ready to develop sites for business activity occurring within the city's boundaries.

Implementation Steps

Establish a priorities hierarchy for contaminated sites that reflect the city's Economic Development Strategy.

Continue to require the reporting of oil and chemical spills and to assist in the clean-up of spills and with the disposal of waste which might pollute ground and surface waters.

Supplement pollution clean-up and land-readying activities with state, federal, and Neighborhood Revitalization Program funds.

Place a higher legislative priority on clean-up assistance programs at the state and federal levels.

Undeveloped and underutilized land is a scarce resource in Minneapolis. Future decisions about land use must be made wisely; clean-up programs are essential if the city is to succeed in attracting new business and provide room for expansion and site preparation for existing businesses. Equally important to the city's future prosperity is an emphasis on the prevention of further pollution. Many private sector companies are well on their way to making their processes and products less toxic to the environment; some of the leaders in this effort have discovered intrinsic economic benefits to adopting new technologies and more stringent pollution control measures. The need to create innovative measures to promote pollution prevention, whether in the form of incentives or using the best available technologies, is a pressing one for the City of Minneapolis.

7.8 Minneapolis will continue to support pollution prevention programs as an important first step in maintaining a healthy physical environment.

Implementation Steps

Require that projects which receive city assistance disclose efforts to minimize toxic releases and waste disposal.

Encourage project developers to minimize toxic releases and waste disposal. Educate and inform project developers on the use of non-toxic, safe products and materials, the impact of toxic releases and waste disposal, through the permit review process.

managing human impact

To ensure that Minneapolis' natural features retain the same quality and integrity well into the adult lives of future generations, we must educate ourselves about the lifestyle choices we make. Informing ourselves about the environmental impact of our activities furthers our understanding of how everyday decisions about getting to work, doing our shopping, heating our homes, learning and entertaining, influence the quality of life we experience in the city today. Some of the decisions made are wasteful; building low density single family dwellings, providing incentives for car ownership and constructing miles of expressways and parking lots consumes tremendous amounts of energy, water and land, and contribute significantly to the environmental challenges cities face.

energy conservation

Maximizing energy efficiency and adopting policies that influence conservation practices is one of the first steps a community can take in educating individuals, as well as entire communities, about the costs of wasteful resource use. Education, incentives and regulations all have a critical role to play in improving the quality of the urban environment. Reducing dependence on non-

renewable fossil fuels, improving construction techniques to maximize energy efficiency and to make use of high quality, environmentally sound materials, and mobilizing city practices and actions to create wise-use consumer practices all play a role in the city's focus on energy efficiency and conservation. These policies will considerably reduce the intensity of resource extraction and waste generated by daily urban life, whether in new construction, heating their homes or driving their vehicles.

Standards to measure and enforce energy efficiency can be extended to homeowners as well as rental property owners. The City of Minneapolis can also encourage the participation of partners who receive public financing assistance by promoting maximum energy efficiency and connection to district energy systems when appropriate.

7.9 Minneapolis will make buildings more energy efficient.

Implementation Steps

Work with the real estate and utility industry to develop methods to rate housing energy use.

Encourage builders and building managers to build and operate so as to have the least harm on the environment, the greatest possible energy efficiency, and the healthiest environment for the occupants.

Use all means available to ensure that indoor spaces are made safer, more pleasant and productive by ensuring adequate ventilation, reducing sources and concentration of pollutants, carefully selecting materials, and the wise use of natural over artificial light.

Educate property owners on energy efficiency measures and conservation improvement programs (CIPs) through the building code process.

Encourage all development projects to a) disclose the relative energy efficiency of the project; b) participate in all applicable Conservation Improvement Programs (CIPs), and c) implement environmental or energy efficiency measures that have a simple payback period of ten years of less.

Encourage compliance with provisions of the Mpls St Paul Urban CO_2 Project Plan

Reduce the amount of electricity needed to provide lighting of city streets and neighborhoods without compromising safety and illumination.

Promote the transition to cleaner alternative fuels (such as natural gas instead of coal and oil) and renewable fuels (hydro, wind, biomass, and solar).

It is also important to ensure that both new construction as well as older buildings located in the city are safe and habitable for residents, workers and visitors. The scope of this work can range from building code conformance to fire code requirements.

7.10 Minneapolis will enhance the safety and appearance of our built environment through education, inspection and enforcement.

Implementation Steps

Conduct inspections of property on the basis of permitted work and complaints.

Provide customers with information on how to safely do construction work.

Provide exterior maintenance inspection services for commercial buildings.

Perform fire code inspections, issue violation orders and follow through to their compliance.

Review construction plans for new buildings and inspect fire suppression systems to ensure fire code compliance in the construction stage.

Coordinate the work of Inspections and the city's Heritage Preservation Commission to ensure that changes and alterations to buildings are safe and maintain the architectural integrity of historic structures, water conservation and energy savings.

waste reduction

Humans generate a tremendous amount of waste. On a per capita basis, we throw out close to one ton of waste annually, including mixed municipal solid waste, commercial, demolition debris and hazardous waste. The amount of waste generated by individual citizens, as well as the larger community of business and corporate citizens places great demands on our ability to process and dispose of this waste safely. The amount of energy and waste in raw materials implicit in throwing out this amount of garbage offers the potential for savings in the form of recycling and re-use of materials. Businesses and individuals alike have made tremendous inroads into the idea of reuse and efforts such as these will continue to be supported at the city level. Through its own example and by educating residents, workers, and business owners about best practices and best available technology in waste management methods, the city will encourage others to reduce waste whenever possible.

7.11 Minneapolis will operate waste management programs that focus on reducing solid waste, reusing and recycling materials.

Implementation Steps

Continue to operate waste management practices consistent with the state approved waste management hierarchy.

Follow source reduction criteria in all city operations for new construction, demolition and renovation activities.

Continue to educate citizens about the risks associated with using products that generate hazardous waste.

Minimize the use of products that generate hazardous waste in city operations.

Strongly emphasize and promote reduction, reuse and recycling, including the purchase of recycled materials.

Make product purchase decisions based on selecting products that have high post consumer recycled material content, long product life expectancy, product life cycles with minimal environmental impacts, and high potential for recycling or reuse.

Encourage reuse of existing materials or recycled content materials for city purposes, including new construction or renovation projects.

Educate residents and property owners of the benefits of properly composting and reusing yard wastes and vegetable food wastes.

Provide seasonal yard waste collection services from spring through fall.

Assign waste that cannot be reused, recycled or composted to incineration facilities that recover some of the imbedded energy value in garbage.

Use landfilling as a last alternative for waste disposal.

Use best available pollution control technology to ensure that waste processing facilities, landfill sites, and storage and disposal facilities that receive hazardous waste and incinerator ash meet Minnesota's stringent operating standards.

Source reduction for municipal government has traditionally meant that product purchase decisions are based on selecting products that have long product life expectancy or life cycles with minimal environmental impacts,. “Green” or environmentally friendly purchasing practices will continue to be pursued by the city. Effectively, this means that city purchasing decisions will select products with high post consumer recycled material content or with high potential for reuse and recycling. Use of products that generate hazardous waste is and will be kept to a minimum. These criteria are applied to new construction, renovations, and ongoing operations.

After maximizing source reduction, the city will emphasize reuse and recycling, These approaches direct garbage and yard waste away from the less desirable options of incineration or landfill disposal.

Landfilling is the least preferred option for waste disposal, as described in state and regional waste management hierarchy, and it should be reserved for wastes that cannot be dealt with under the previously described methods. Landfill sites that receive city wastes, including hazardous waste and incinerator ash derived from city wastes, must meet Minnesota's stringent operating standards and make use of the best available pollution control technology.

demonstrating by example: pilot projects

In order to better manage its impact on the natural environment, the City of Minneapolis will expand conservation programs in its divisions and departments. The example set by city government can also influence other partners to work with the city in continuing to push sustainability issues to the center of decision making agendas. One of the most readily available tools that will enable the city to evaluate progress on sustainability goals is a set of indicators. Agreeing on which indicators should be used will assist in demonstrating the links between environmental impacts, economic growth and social well-being in our community.

Another example can be found in the "City as a Model" program, which would require that policies, plans, expenditures, lobbying positions, investments and subsidy or permit decisions conform to economic and environmental sustainability objectives. This kind of initiative could result in the city reusing recycled materials in its operations, from construction of new structures to the printing and publishing of education materials, a conservation program implemented for all city departments’ activities, or promoting the adaptive reuse of city-owned buildings.

7.12 Minneapolis will play a leadership role in setting up examples and pilot projects.

Implementation Steps

Continue to improve the efficiency of buildings owned or used by city departments.

Reinvest savings generated from municipal building retrofits for further building projects and retrofits.

Make city operations and purchases more environmentally sensitive by choosing environmentally-friendly products and reusing buildings or materials whenever feasible.

Minimize the use of processes employed in city operations which generate toxic residues and leachates.

Investigate a "green fleets" program to purchase only cars and light trucks that are among the top 10% in efficiency in their class. Implement a travel demand management (TD) program to encourage municipal employees to be less reliant on the car.

Promote the incorporation of true and life cycle costing techniques in public investment decisions.

Develop a set of indicators with the assistance of other public agencies that measure city activity in protecting the natural environment, managing the transportation system, implementing housing strategies and promoting economic development initiatives.

putting it together

Many of the most successful sustainability initiatives underway in Minneapolis are community-based projects that have focused attention on local activities. Community gardens, stormwater management campaigns, local business-to-business economic transactions, skills exchanges and tool libraries are some of the programs that have been put into practice in neighborhoods across the city. We must absorb some of the lessons emerging from the work undertaken by community groups and private groups as well as non-profit sector stakeholders. Doing so connects the community to a broader current of commonly held values about environmental sensitivity and decision making. The commitment to "do no harm" to the resources and opportunities of future generations of residents will lead us as a community to a conscientious and far sighted understanding of what constitutes wealth. The long-term livability and health of our city depends on a definition of wealth that goes beyond material success, and is measured according to a time frame that extends beyond the average seven decades that we as individuals live on this earth. As our neighborhoods grow and the city continues to thrive as the economic heart of a prosperous region, an appreciation of the community's wealth will include not only the built city we see around us but the natural features of water, land, trees, air and light.